

## WIRELESS NETWORKS

Faculty of Computer Science			
Study programme:	Computer Science		Degree level: <b>Engineer's degree full-time programme</b>
Specialization	---		Diploma path: <b>2026/2027W - 2026/2027S</b>
Module name:	<b>Wireless Networks</b> ( Sieci bezprzewodowe)		
Module type:	<b>obligatory</b>	<b>Semester: 2</b>	ECTS:4    Module ID: <b>FCS-00097</b>
No. of hrs in semester:	Lecture (L) - <b>30</b> Classes(C) - <b>0</b> Specialization workshop (SW) - <b>0</b> Project (P) - <b>0</b> Laboratory classes (LC) - <b>30</b> Seminar (S) - <b>0</b>		
Prerequisites	Foundations of Electrotechnics and Electronics ( FCS-00053), Computer Networks ( FCS-00026), Introduction to Linux ( FCS-00057),		
Aims and objectives:	The aim of the course is to prepare the student to work with wireless networks. Students will become familiar with the operation of wireless networks on the basis of physics and computer science. They learn how to configure devices and secure networks against unauthorized access. They will be able to properly use the available antenna.		
Forms of teaching activities::	lecture, laboratory classes,	Assessment:	Evaluation must be relevant to the intended learning outcomes:
		Lecture - written exam laboratory - exercise reports	
Module content:	Electromagnetic waves, Maxwell's equations. The spectrum of electromagnetic waves. The propagation of electromagnetic waves. Polarization of electromagnetic waves. Modulation, modulation types, modulation characteristics. Antennas, operational parameters. The units. 802.11 wireless standards. BSS, ESS. Configuration of network devices. Security in wireless networks, WEP, WPA, WPS.		
Teaching methods:	manufacturing practice, laboratory exercises, situational method, case method, lecture problem,		
Learning outcomes			
Symbol	Specify min. 4, max. 8 learning outcomes in the following order: knowledge - skills - competence. Each learning outcome must be verifiable		Reference to the programme learning outcomes of education
L01	knows the basic principles of physics to understand the phenomena used for wireless transmission		
L02	knows the standards used in wireless data transmission		
L03	knows the devices used in wireless transmission and can use them to build a network		
L04	can design and secure a simple wireless network		
No. of learning outcome	Methods of assessing the learning outcome		Type of teaching activities (if more than one) during which the outcome is assessed
L01	written exam		L
L02	written exam, report on the exercise grade		L,Lab
L03	report on the exercise grade		Lab
L04	report on the exercise grade		Lab
Student's workload (in hours)	1 - Attendance at lectures		None    30
	2 - Attendance at classes		None    30
	3 - Preparation for laboratories		None    10
	4 - Preparation of reports		None    20
	5 - Preparation for exam and attendance		None    10
			<b>TOTAL:</b> <b>100</b>
Quantitative indicators	Student's workload - activities that require direct teacher participation: (1)+(2)		60 <b>ECTS</b> 2.4
	Student's workload connected with practical classes (4)+(2)+(3)		60    2.4
Basic references:	<ol style="list-style-type: none"> <li>1. M. S. Gast, 802.11 Wireless Networks: The Definitive Guide. O'Reilly Media 2005.</li> <li>2. E. Perahia, R. Stacey, Next Generation Wireless LANs: 802.11n and 802.11ac. Cambridge University Press 2013.</li> <li>3. J. Geier, Designing and Deploying 802.11n Wireless Networks. Cisco Press 2010.</li> </ol>		
Further reading	<ol style="list-style-type: none"> <li>1. IEEE documents (standards.ieee.org).</li> <li>2. RFC (Request for Comments) documents.</li> <li>3. S. R. Saunders, Antennas and propagation for wireless communications systems, Wiley, Chichester 2007.</li> </ol>		
Unit:	Department of Information Systems and Computer Networks	Lecturer/ instructor	
Date of issuing the programme:	31st March 2026	Author of the programme:	dr inż. Tomasz Grześ

L - lecture, C - classes, LC - laboratory classes, P-project, SW  
- specialization workshop, S - seminar